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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/577,300

01/25/2007

Dieter Lehmann

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GREENBLUM & BERNSTEIN, P.L.C.  
1950 ROLAND CLARKE PLACE  
RESTON, VA 20191

EXAMINER

PAUL, JESSICA MARIE

ART UNIT

PAPER NUMBER

1796

NOTIFICATION DATE

DELIVERY MODE

12/18/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

gbpatent@gbpatent.com  
pto@gbpatent.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/577,300	<b>Applicant(s)</b> LEHMANN, DIETER	
	<b>Examiner</b> Jessica Paul	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 07 August 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-5,7 and 9-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5,7 and 9-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>8/7/09</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Instant claim 12 depends from claim 6, which has been cancelled. The examiner interprets claim 12 to depend from claim 1.

Claim 12 recites the limitation "and/or amide bonds" in line 5. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 7, and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Machi et al. (US Patent No. 4129617).

Regarding claims 1, 2, 7, and 9; Machi et al. teach a graft copolymer comprising a backbone chain of a fluoropolymer and side chains grafted thereon consisting essentially of at least a member selected from the group consisting of acyloxystyrene, diacyloxystyrene, hydroxystyrene, and dihydroxystyrene, or additionally a polyene

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compound [abs]. Machi et al. teach the monomers can be grafted onto a fluoropolymer by means of an ionizing radiation through “pre-irradiation” or, alternatively “simultaneous-irradiation [col1, line31-40].” In the case where a “pre-irradiation” method is used, a fluoropolymer can be irradiated with an ionizing radiation in a vacuum, in air to form on the fluoropolymer trapping radical-sites or polymeric peroxide-sites followed by dipping the irradiated fluoropolymer in a solvent containing acyloxystyrene and/or a hydroxystyrene or a mixture thereof with a polyene compound to make the monomer or monomers graft onto the polymer at trapping radical-sites or polymeric peroxide-sites (perfluoroalkyl-(peroxy-) radical centers) thus formed [col3, line66-col4, line9].

Machi et al. teach, in a preferred embodiment, irradiating a strip of polyvinylidene fluoride film with 30 Mrads of electron beams in air (oxygen; instant claim 2) at -20°C, after which a monomer solution comprising 50% by weight of p-acetoxystyrene (olefinically unsaturated monomer) and 50% by weight acetone was added and reacted at 70°C (coupling via radical reactions) [col5, line30-51, ex1]; wherein the polyvinylidene fluoride polymer is substituted by Teflon® PFA (perfluoropolymer) [col2, line12-13]. The degree of grafting (through reactive sites; instant claim 7), before and after the reaction, was 157% [col5, line46-50]. The examiner notes that claim 9 further defines an optional coupling technique (substitution reactions wherein at least one substance is coupled to ester bonds).

Machi et al. teaches irradiation of a fluoropolymer at a large dose (300 kGy) under the presence of oxygen, however fails to teach the surface of the perfluoropolymer simultaneously having -COOH and/or -COF groups. The Office

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realizes that all the claimed effects or physical properties are not positively stated by the reference. However, the reference teaches all of the claimed reagents and was prepared under similar conditions. Therefore, the claimed effects and physical properties, i.e. having –COOH and/or –COF groups, would implicitly be achieved by a composition with all the claimed ingredients. If it is the applicants' position that this wouldn't be the case: (1) evidence would need to be presented to support applicants' position; and (2) it would be the Offices' position that the application contains inadequate disclosure that there is no teaching as to how to obtain the claimed properties and effects with only the claimed ingredients.

Regarding claims 3 and 4; the examiner notes that “a radiation dose of more than 50 kGy or greater than 100 kGy are product by process limitations. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” See *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Claims 13-16 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Machi et al. (US Patent No. 4129617).

Regarding claims 13-16 and 20; Machi et al. teach a graft copolymer, and a process for producing thereof, comprising a backbone chain of a fluoropolymer and side

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chains grafted thereon consisting essentially of at least a member selected from the group consisting of acyloxystyrene, diacyloxystyrene, hydroxystyrene, and dihydroxystyrene, or additionally a polyene compound [abs]. Machi et al. teach the monomers can be grafted onto a fluoropolymer by means of an ionizing radiation through “pre-irradiation” or, alternatively “simultaneous-irradiation [col1, line31-40].” In the case where a “pre-irradiation” method is used, a fluoropolymer can be irradiated with an ionizing radiation in a vacuum, in air to form on the fluoropolymer trapping radical-sites or polymeric peroxide-sites followed by dipping the irradiated fluoropolymer in a solvent containing acyloxystyrene and/or a hydroxystyrene or a mixture thereof with a polyene compound to make the monomer or monomers graft onto the polymer at trapping radical-sites or polymeric peroxide-sites (perfluoroalkyl-(peroxy-) radical centers) thus formed [col3, line66-col4, line9].

Machi et al. teach, in a preferred embodiment, irradiating a strip of polyvinylidene fluoride film with 30 Mrads (300 kGY; instant claims 15 and 16) of electron beams (radiation-chemically modified; instant claim 14) in air (oxygen) at -20°C, after which a monomer solution comprising 50% by weight of p-acetoxystyrene (olefinically unsaturated monomer, instant claim 20) and 50% by weight acetone was added and reacted at 70°C (coupling via radical reactions) [col5, line30-51, ex1]; wherein the polyvinylidene fluoride polymer is substituted by Teflon® PFA (perfluoropolymer) [col2, line12-13].

Machi et al. fails to teach the surface of the perfluoropolymer simultaneously having –COOH and/or –COF groups. The Office realizes that all the claimed effects or

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physical properties are not positively stated by the reference. However, the reference teaches all of the claimed reagents and was prepared under similar conditions.

Therefore, the claimed effects and physical properties, i.e. having –COOH and/or –COF groups, would implicitly be achieved by a composition with all the claimed ingredients.

If it is the applicants' position that this wouldn't be the case: (1) evidence would need to be presented to support applicants' position; and (2) it would be the Offices' position that the application contains inadequate disclosure that there is no teaching as to how to obtain the claimed properties and effects with only the claimed ingredients.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Machi et al. (US Patent No. 4129617) as applied to claim 1 above.

Machi et al. teach the basic claimed modified fluoroplastic composition as set forth above, with respect to claim 1.

Regarding claims 10-12; Machi et al. teach the graft copolymer, prepared by co-grafting a combination of (1) an acyloxystyrene and/or a hydroxystyrene (reactively activatable group) and (2) a polyene compound onto a fluoropolymer with the aid of an ionizing radiation [col1, line47-64]. Polyene compounds used for the graft

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polymerization (via radical reactions) include those compounds which have two or more polymerizable double bonds (reactively activatable functional group; instant claims 10 and 12) in their molecule such as, for example, divinylbenzene (olefinically unsaturated compounds; instant claim 11), polyalcohol esters of (meth)acrylic acid, divinyl ester of adipic acid and the like [col2, line45-52]. When a polyene compound is used, partial crosslinkings of the resulting graft copolymer due to the grafted polyene compound can be observed [col4, line8-11].

Although Machi et al. does not teach irradiation of a fluoropolymer in air; followed by addition of an acyloxystyrene and/or hydroxystyrene and a polyene compound in a preferred embodiment; a reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill the art, including the non-preferred embodiments. *Merck & Co. v. Biocraft Laboratories*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.). Therefore, it would have been obvious, to one having ordinary skill in the art, at the time of the invention, to try; picking and choosing from a finite number of identified, predictable solutions, with reasonable expectation of success.

Claims 18 and 21- 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Machi et al. (US Patent No. 4129617) as applied to claim 13 above.

Machi et al. teach the basic claimed method for producing the modified fluoroplastic composition as set forth above, with respect to claim 13.

Regarding claims 18 and 21-26; Machi et al. teach preparing a graft copolymer, by co-grafting a combination of (1) an acyloxystyrene and/or a hydroxystyrene (low molecular substance containing hydroxy groups/alcohol group; instant claims 21-26)



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and (2) a polyene compound onto a fluoropolymer with the aid of an ionizing radiation [col1, line47-64; col2, line62-col3, line2]. The fluoropolymer can be used in the form of powder [col2, line16]. Polyene compounds used for the graft polymerization include those compounds which have two or more polymerizable double bonds (reactively activatable functional group) in their molecule such as, for example, divinylbenzene (olefinically unsaturated polymerizable compounds), polyalcohol esters of (meth)acrylic acid, divinyl ester of adipic acid and the like [col2, line45-52]. When a polyene compound is used, partial crosslinkings of the resulting graft copolymer due to the grafted polyene compound can be observed [col4, line8-11]. Machi et al. teach the monomers are dissolved in an organic solvent, such as N,N-dimethylformamide, (substance containing amide group with at least one other active functional group, in this case H; instant claim 25) [col3, line25-26]. When the irradiation is effected in air, the graft polymerization is advantageously carried out at a temperature at or above 60°C (>150°C and ≥200°C, instant claims 21 and 22) [col4, line16-20]. At the time of the invention, a person having ordinary skill in the art would have found it obvious to employ temperatures greater than 60°C (up to 200°C), and would have been motivated to do so because Machi et al. suggests that such temperatures are suitable to the present invention.

Machi et al. do not teach the irradiation in air of perfluoropolymer in powder form, and employing hydroxystyrene and/or polyene monomers to the composition in a preferred embodiment. However, a reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill the art, including the non-

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preferred embodiments. *Merck & Co. v. Biocraft Laboratories*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.). Therefore, it would have been obvious, to one having ordinary skill in the art, at the time of the invention, to try; picking and choosing from a finite number of identified, predictable solutions, with reasonable expectation of success.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Machi et al. (US Patent No. 4129617) as applied to claim 1 above, and further in view of Coates et al. (US Serial No. 2003/0199639).

Machi et al. teach the basic claimed modified fluoroplastic composition as set forth above, with respect to claim 1.

Regarding claim 5; Machi et al. fail to teach the perfluoropolymer is polytetrafluoroethylene. Coates et al. teach surface modification of a fluoropolymer via high energy radiation [0016]; preferred fluoropolymers include polytetrafluoroethylene and polyvinylidene fluoride [0032]. Therefore, Coates et al. teach that polytetrafluoroethylene and polyvinylidene fluoride are functional equivalents for the purpose of surface modification via irradiation. It is *prima facie* obvious to substitute art-recognized functional equivalents known for the same purpose (See MPEP § 2144.06).

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Machi et al. (US Patent No. 4129617) as applied to claim 13 above, and further in view of Coates et al. (US Serial No. 2003/0199639).

Machi et al. teach the basic claimed method for producing the modified fluoroplastic composition as set forth above, with respect to claim 13.

Regarding claim 17; Machi et al. fail to teach the perfluoropolymer is polytetrafluoroethylene. Coates et al. teach a process comprising the surface modification of a fluoropolymer via high energy radiation [0016]; preferred fluoropolymers include polytetrafluoroethylene and polyvinylidene fluoride [0032]. Therefore, Coates et al. teach that polytetrafluoroethylene and polyvinylidene fluoride are functional equivalents for the purpose of surface modification via irradiation. It is *prima facie* obvious to substitute art-recognized functional equivalents known for the same purpose (See MPEP § 2144.06).

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over over Machi et al. (US Patent No. 4129617) as applied to claim 13 above, and further in view of Lehmann (WO 99/61527); wherein US Patent No. 6770378 is used as an English translation for purposes of citation.

Machi et al. teach the basic claimed method for producing the modified fluoroplastic composition as set forth above, with respect to claim 13.

Regarding claim 19; Machi et al. fail to teach the modified perfluoropolymer powder is treated by subsequent tempering with humid air. Lehmann teaches if the irradiation occurs in air (including “humid air”), subsequent hydrolysis of the –COF groups occurs, and carboxyl groups will result (reads on applicant’s required subsequent tempering with humid air) [col2, line6-9]. Lehmann and Machi et al. are

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combinable because they are both concerned with the same field of endeavor, namely surface modified fluoropolymers via irradiation under the influence of oxygen. At the time of the invention, a person having ordinary skill in the art would have found it obvious to temper the fluoropolymer in the method for producing a fluoroplastic as taught by Machi et al., with humid air as disclosed by Lehmann, with motives to produce a surface modified fluoropolymer having carboxyl groups [as taught by Lehmann, col2, line6-9].

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-5, 7, and 9-26 have been considered but are moot in view of the new ground(s) of rejection.

Coates et al. is relied upon for the teaching of polytetrafluoroethylene fluoropolymer.

Lehmann is relied upon for the teaching of treatment with humid air of the fluoropolymer.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessica Paul whose telephone number is (571)270-5453. The examiner can normally be reached on Monday thru Friday 8:00- 6:00p; alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on 571-272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Eashoo/  
Supervisory Patent Examiner, Art Unit 1796

Jessica Paul  
Examiner  
Art Unit 1796

/JMP/